

Application No.: 10/720,967  
Docket No.: PE0649 US DIV7

Page 6

### REMARKS

#### Status of the Claims

The pending claims are 1-8, 12, and 13.

Claim 1 is amended to recite that 100% of the emitting layer comprises at least one iridium compound as defined therein.

Claims 5-8 are rewritten, with Claims 5 and 6 in independent form, and Claims 7 and 8 dependent from Claim 6.

Support for an emitting layer that is greater than 20% by weight iridium compound up to 100% by weight iridium compound is set forth at page 12, lines 17-19 of the specification. Amended independent claims 5 and 6 are generally supported at page 2, lines 1-28. Claims 5 and 6 are derived in part from Claim 1, and are supported thereby. Claim 5 is supported by original Claim 10 (canceled by this Amendment). The definitions of A and substituents R<sub>1</sub> to R<sub>3</sub> are derived from Claim 1, retain the assigned values in the original claims 5-8, or are particular sub-species derived from original Claim 1. No new matter is introduced.

Claims 10-11 have been canceled.

#### Rejections under 35 U.S.C. § 103

The Examiner rejected Claims 1-4, 12 and 13 as being obvious over several primary and secondary references. Each rejection is addressed separately below.

##### 1. Baldo-I in view of Dedeian

Claims 1-3 and 12-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Baldo et al. letter, Nature, Vol. 403, 17 February 2000, pp. 750-753 ("*Baldo-I*"), in view of the Dedeian et al. article, Inorganic Chemistry, Vol. 30, 1991, 1685-1687 ("*Dedeian*"). (Claims 10 and 11 have been canceled, as noted above). Applicants respectfully traverse this rejection with respect to Claims 1-3, 12, and 13.

*Baldo-I* discloses an Iridium(III) complex with unsubstituted 2-phenylpyridine. *Dedeian* discloses a new synthetic route to the preparation of Ir(III) complexes with 2-phenylpyridines. *Dedeian* discloses several monosubstituted and unsubstituted phenylpyridine ligands (Table I). The *fac* tris-ortho-metalated Ir(III) complexes disclosed are identified as strong photoreductants. There is no teaching or suggestion in *Dedeian* that any species therein disclosed would be useful as a phosphorescing molecule.

Neither *Baldo-I* nor *Dedeian* discloses a device in which at least one iridium complex is present in an emitting layer in a concentration of 100% by weight, as recited in Applicants' Claim 1, and dependent Claims 2-4, 12, and 13. *Baldo-I* teaches only an unsubstituted

Application No.: 10/720,967  
Docket No.: PE0649 US DIV7

Page 7

iridium phenylpyridine complex present as a sensitizer in a host at a concentration of 10%. There is no teaching or suggestion in *Baldo-1* of using the iridium complex alone, without a host. *Dedeian* teaches the use of iridium phenylpyridine complexes as photoreducing agents. *Dedeian* does not teach or suggest the use of these complexes in electronic devices at any concentration. There is nothing in the teaching of *Baldo-1* and *Dedeian*, individually and collectively, that would suggest using the iridium complex in a concentration of 100% by weight in an emitting layer of an electronic device. Nor is there any suggestion in either reference that the two could be combined to lead to an emitting layer that is 100% by weight iridium compound. *Dedeian* has no teaching or suggestion that the various substituents disclosed affect utility or performance of the molecules in any way. There is no teaching or suggestion in either reference that would motivate one skilled in the art to combine these references or modify either one in any way to attain the claimed device. Rather, *Baldo-1* teaches away from any such combination by disclosing only unsubstituted ligands for the sensitizer application. Thus reading *Baldo-1*, a reasonably skilled practitioner would not be motivated to substitute the pyridine ring with a fluoro or trifluoromethyl substituent (all of *Dedeian*'s ligands are 4-substituted except for one species, methoxypyridine, which is 5-substituted) or to vary these substituents to include, in addition to fluoro and trifluoromethyl,  $-C_nF_{2n+1}$ ,  $-OC_nF_{2n+1}$ , and  $-OCF_2X$  where  $n = 1-6$  and  $X = H, Cl, \text{ or } Br$ , or to form a 5- or 6-membered ring from adjacent  $R_1 - R_4$  groups and  $R_5 - R_8$ . It would not have been *prima facie* obvious that a photoreductant would be an efficient phosphorescent molecule. Nor would its suitability as an emitting layer in an electronic device have been obvious from *Dedeian*'s disclosure of a limited number of species as strong photoreductants. In these respects, this application is entirely different from the facts in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 65 U.S.P.Q. 297 (S.Ct 1945). The *Dedeian* species did not have known properties outside those disclosed, *i.e.*, as reductants in photochemical redox reactions.

Applicants respectfully submit that pending Claims 1-3, 12 and 13, are patentable over *Baldo-1* in view of *Dedeian*. It is respectfully requested that this rejection be withdrawn.

## 2. *Baldo-1* in view of *Djurovich*

Claims 1-3 and 10-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Baldo et al. letter, *Nature*, Vol. 403, 17 February 2000, pp. 750-753 ("*Baldo-1*"), in view of the Djurovich et al. article, *Polymer Preprints* 41(1), 2000, pp. 770-771 ("*Djurovich*"). As previously noted, Claims 10 and 11 have been canceled. Applicants respectfully traverse this rejection with respect to Claims 1-3, 12, and 13.

Application No.: 10/720,967  
Docket No.: PE0649 US DIV7

Page 8

Neither *Baldo-1* nor *Djurovich* discloses a device in which an iridium complex is present in an emitting layer in a concentration of 100% by weight, as recited in Applicants' Claim 1, and dependent Claims 2-8, 12, and 13. Both *Baldo-1* and *Djurovich* teach the use of iridium complexes in a host material. There is nothing in the teaching of *Baldo-1* and *Djurovich*, individually and collectively, that would suggest using the iridium complex in a concentration of 100% by weight in an emitting layer of an electronic device. *Djurovich* teaches away from Claim 1 and its dependent claims in that this reference teaches the use of a 4',5'-fluorinated Ir(ppy)<sub>3</sub> complex in a polymer blend, and not in a concentration of 100% by weight of the emitting layer. The components of a typical solution for a single-layer LED polymer blend are taught in *Djurovich* at page 771, column 1, lines 7-9: no more than about 4% of the blend is Firppy.

Applicants respectfully request that this rejection be withdrawn.

3. *Baldo-1* in view of *Dedeian* and further in view of *Baldo-2*

Claim 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Baldo et al. article, *Nature*, Vol. 403, 17 February 2000, pp. 750-753 ("*Baldo-1*"), in view of the Dedeian et al. article, *Inorganic Chemistry* 30, 1991, pp. 16850-16871 ("*Dedeian*"), and further in view of WO 00/70655 to Baldo et al. ("*Baldo-2*"). Applicants respectfully traverse this rejection.

There is no suggestion in the *Dedeian*, *Baldo-1*, or *Baldo-2* references, individually or collectively, to use an iridium complex with a phenylpyridine ligand having F substituents in an electronic device, where the iridium complex is present at a concentration of 100% by weight, as recited in Applicants' Claim 4, as amended herein. *Dedeian* and *Baldo-1* have been discussed in detail hereinabove. *Baldo-2* discloses an Ir(III)-2-phenylpyridine complex wherein the phenylpyridine ligand may be substituted with alkyl or aryl, preferably in the 3, 4, 7 and/or 8 positions. *Baldo-2* teaches that the aromatic structure may be modified (by adding a nitrogen atom to the pyridine ring, and/or converting the phenyl ring to pyridine by the substitution of a nitrogen atom for a carbon atom). *Baldo-2* also teaches generally that alkyl or aryl may be substituted, preferably, in the 3, 4, 7 and/or 8 positions for steric reasons (the "and/or" is *Baldo-2*'s only teaching that multiple substitutions may be made). *Baldo-2* does not teach whether "and/or" envisions more than one substitution on the same ring, or different rings. *Baldo-2* emphasizes steric considerations to the exclusion of any teaching or suggestion regarding how placement of substituents and the identity of the substituents might affect emissive properties or utility. For reasons stated above, there is no teaching or suggestion in any of these references for combining *Dedeian* with either *Baldo-1* or *Baldo-2* or for modifying any of these references based on teachings in another.

Application No.: 10/720,967  
Docket No.: PE0649 US DIV7

Page 9

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness, and respectfully request that this rejection be withdrawn.

Conclusion

Based on the foregoing amendments and remarks, it is respectfully submitted that the Claims are now in condition for allowance. A Notice of Allowance is earnestly solicited.

Applicants are filing, concurrently herewith, a petition to extend the time within which to file this paper by two (2) months, with authorization to charge the requisite fee to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company).

Should the Examiner have questions about the status of the application or the contents of this paper, the Examiner is invited to call the undersigned at the telephone number listed below.

Respectfully submitted,



JOHN H. LAMMING  
ATTORNEY FOR APPLICANTS  
Registration No.: 34,857  
Telephone: 302-992-5877  
Facsimile: 302-892-1026

Dated: May 5, 2006

RECEIVED  
CENTRAL FAX CENTER

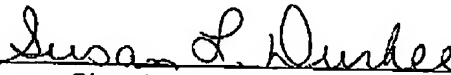
MAY 05 2006

PTO/SB/97 (09-04)  
Approved for use through 07/31/2006. OMB 0851-0031  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE  
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

**Certificate of Transmission under 37 CFR 1.8**

USPTO Fax No.: (571) 273-8300

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office

on MAY 5, 2006  
Date  
Signature

SUSAN L. DURKEE

Typed or printed name of person signing Certificate

Registration Number, if applicable

302-892-1892  
Telephone Number

Note: Each paper must have its own certificate of transmission, or this certificate must identify each submitted paper.

10/720967

PE0649USDIV7

AMENDMENT AND RESPONSE UNDER 37 CFR 1.111  
PETITION FOR EXTENSION OF TIMEPage 1 of 11

This collection of information is required by 37 CFR 1.8. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1.8 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.